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PATENT SPECIFICATION

DRAWINGS ATTACHED

1.121.036

1.121.036



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Int. Cl.: —D 04 h 11/04

COMPLETE SPECIFICATION

Method and Apparatus for Making Pile Fabric

We, SOCIETE D'ETUDES ET RECHERCHES D'EXPLOITATION D'INVENTIONS NOUVELLES, ETABLISSEMENT, of 33, Stadtle-Vaduz, Lichtenstein, a Lichtenstein Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a method of and apparatus for manufacturing fabrics with non-woven pile such as carpets or velvets.

It is known to manufacture fabrics by coating a layer of adhesive on one side only of two continuous support bands, the support bands then being displaced in a passage so that the bands are disposed substantially parallel to one another at a predetermined distance from one another with the adhesive layer on each of the support bands facing the adhesive layer on the other support band; a warp of continuous elements is moved by folder blades alternately against the adhesive layers on the support bands when the support bands are displaced at the entrance to the passage or in the neighbourhood thereof, to fold the warp into a zig-zag shape; at least one of the adhesive layers is then supported and the support bands are separated from one another.

According to the British Patent Specification No. 965528, the warp of continuous elements is moved alternately against the adhesive layers on the support bands without considering the line of impact of the folder blades against the warp of continuous elements. Generally, each folder blade is displaced in such a way that the blade comes into contact with the warp of continuous elements in the neighbourhood of the edge of the entrance of the passage, with a result that the blade slides on the warp before applying the loop of the new fold against the adhesive layer corresponding thereto. Such a sliding

of the blades alternately against the warp presents disadvantages.

By the sliding friction, the blade may damage the warp. Also, the sliding produces irregular loops in the folds formed. Moreover, as a result of such sliding, the blade produces a traction on the fold which has just been formed. The traction, which is at first oblique to the adhesive layer to which the fold is stuck and then is subsequently perpendicular to the layer, tends to pull at the last fold and prevent adhesion.

An object of the present invention is to improve the above-mentioned method by reducing or eliminating the above disadvantages.

The invention consists in a method of manufacturing fabrics with non-woven pile, such as carpets or velvets, including the steps of moving a pair of continuous support bands along a passage with the bands disposed substantially parallel to the longitudinal axis of the passage and to each other and at a predetermined distance from each other, and folding a warp continuously and alternately in opposite directions to form a series of bellows folds between the support bands in the passage by moving a pair of folder blades alternately into contact with opposite sides of the warp so that the contact area of each blade on the warp is at a distance along the warp from the previous fold in the sequence of folds equal to the predetermined distance between the support bands.

Another object of the present invention is to provide apparatus for carrying out the method according to the present invention.

The invention also consists in apparatus for manufacturing fabrics with non-woven pile, including means for moving a pair of continuous support bands along a passage with the bands disposed substantially parallel the longitudinal axis of the passage and to each other and at a predetermined distance

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from each other, means for folding a warp at the entrance of the said passage comprising two folder blades arranged to move the said warp continuously and alternately in opposite directions to form a series of bellows folds between the support bands in the passage, supporting means for each folder blade, suspension means for each supporting means and operating means wherein the suspension means comprises a plurality of suspension members each pivotally connected at one end to a fixed part of the apparatus and pivotally connected at the other end to the supporting means such that the centre-to-centre distance between adjacent pivots of suspension members on the supporting means and the length of at least one suspension member is adjustable.

An embodiment of the invention will now be described by way of example only with reference to the accompanying drawings in which;

Figure 1 is an elevation.

Figure 2 is a diagrammatic view showing the impact of one of the folder blades against the warp of continuous elements.

The apparatus represented serves to manufacture at least one fabric with non-woven pile and, in particular, a carpet. The manufacture of this carpet employs essentially, a warp 1 and two support bands or base sheets 2 and 3. In a general way, the warp 1 is delivered at the entrance of a passage wherein the support bands 2 and 3 are moved at the same speed whilst being parallel and situated at a predetermined distance from one another. The warp 1 is folded in alternate directions (to form a 'concertina' arrangement) at this entrance whilst the loops of the folds are directly applied against the adhesive layers of the two support bands alternately. In the aforesaid passage one adhesive layer is set, and the support band with the unset adhesive layer is drawn aside from the folds which adhere to the hardened layer of the other support band so as to produce a looped or uncut carpet. Alternatively both layers are set, whereupon the folds adhere on both adhesive layers of the support bands which layers are then set and the folds are cut by a cutting device operating along a plane between said bands so as to obtain two cut pile carpets.

In particular, according to the form of embodiment shown in the drawings, each support band is drawn over a roller 4, and is guided along horizontal guides 5 situated in one plane towards a vertical passage 6 defined by vertical guides 7 separated from one another at a predetermined distance.

In the course of their horizontal travel above the guides 5, the support bands 2 and 3 are each covered on their upper face with an adhesive layer 8 provided by an adhesive distributor consisting, for example, of a

spreading band and determining therewith an orifice for the passage of a certain quantity of adhesive proceeding from a supply thereof positioned above the spreading-edge.

In the above-mentioned vertical passage 6, the support bands are displaced parallel to each other with their adhesive layers facing each other.

The apparatus also includes an alternating folding mechanism for the warp 1 at the entrance of the passage 6. This mechanism comprises essentially two folder blades 10 and 11 which fold the warp 1 alternately towards and away from the adhesive layers 8 carried by the support bands 2 and 3 so as to form "concertina" folds 12 which adhere, by their loops, to the adhesive layers 8 and are thus carried by the support bands 2 and 3 along the passage towards the base of the apparatus. After formation of these folds, one and/or the other of the adhesive layers 8 is set to a hardening condition by means, such as heating devices (not shown) and afterwards the folds, fixed to the bands 2 and 3 by the hardened adhesive layers, are cut by cutting means such as a cutting blade (not shown) positioned in the median plane of the passage 6.

The folding mechanism also advantageously includes prefolding flexible bladelets 13 and 14 which are operated respectively by the folder blades 10 and 11. Each bladelet 13 or 14 is moved in advance of and in the same side of the warp 1 as a corresponding older blade 10 or 11. The function of each bladelet (13 and 14) is to deflect the warp 1 in an opposite direction when the warp 1 is moved in a direction towards a side of the passage, by the folder blade not corresponding to the bladelet, so that the warp 1 is in a position, relative to the folder blade, corresponding to the bladelet and the corresponding folder blade, when subsequently operated, will fold the warp 1 in the said opposite direction.

Each folder blade is arranged to contact the warp 1 in a position indicated by the numeral 15. Each blade remains in contact with this warp 1 substantially in the position 15 while the warp 1 is moved by the blade against the corresponding adhesive layer. The position 15 is chosen so that its distance to the fold which has just been formed, measured along the warp 1, is practically equal to the width separating the support bands 2 and 3 in the vertical passage 6.

As can be seen in Figure 2, the specific position 15 of the warp 1, where the pressure of the folder blade is applied, practically describes a circular arc about the end of the bladelet situated below this blade and then a short arc of a circle about the loop of the fold which has just been formed.

So that its end can accomplish the quasi-circular trajectory during the driving of the

warp 1, each folder blade 10 or 11 is mounted on an oscillating connecting-rod 16 which is suspended from two cranks 17 and 18 pivoting respectively about two fixed pivots 19 and 20, of which 20 is operated alternately by an operating device 29. The connecting-rod 16 has a regulable length due to a system of two threaded rods 21 and 22 with left and right hand threads linked by a nut 23 corresponding to these threads, this system being placed between the folder blade and the articulation pivot of the connecting-rod 16 with the crank 17. Furthermore the centre-to-centre distance between the articulation pivots 24 and 25 of the connecting-rod 16 to the cranks 17 and 18 can be regulated in length and to this end the pivots in question may be engaged in several holes or in an elongated slot lying longitudinally with respect to the connecting-rod 16.

Moreover, at least one of the two cranks, and in the case shown the crank 17, is likewise regulable in length due to threaded rods 26 and 27 with left and right hand threads linked together by a nut 28 corresponding to these threads. In the same way, the centre-to-centre distance between the pivots 19 and 24 is likewise regulable. It is due to this double regulation of the centre-to-centre distances of the pivots 24 and 25 on the one hand and 19 and 24 on the other hand and to the possibility of lengthening or shortening the length of the connecting-rod 16 from the side of the warp 1 that one can transmit to the edge of the folder blade entering into contact with the warp 1 a judiciously conceived trajectory depending on the position of retention of the said warp by the bladelet to avoid all sliding of the edge of the blade against this warp and prevent thus all traction on the fold which has just been formed.

It is clear that the invention is not exclusively limited to the form of performance shown and indeed that modifications may be applied to the form, the arrangement and the constitution of certain of the elements involved in its embodiment, with the condition that these modifications are not inconsistent with the following claims.

50 WHAT WE CLAIM IS:—

1. A method of manufacturing fabrics with non-woven pile, such as carpets or velvets, including the steps of moving a pair of continuous support bands along a passage with the bands disposed substantially parallel to the longitudinal axis of the passage and to each other and at a predetermined distance from each other, and folding a warp continuously and alternately in opposite directions to form

a series of bellows folds between the support bands in the passage by moving a pair of folder blades alternately into contact with opposite sides of the warp so that the contact area of each blade on the warp is at a distance along the warp from the previous fold in the sequence of folds equal to the predetermined distance between the support bands.

2. A method as claimed in claim 1 wherein each blade is moved in contact with the warp in a substantially circular path about the edge of a pre-folder bladelet controlled by the said blade, until the said edge reaches the said band.

3. Apparatus for manufacturing fabrics with non-woven pile, including means for moving a pair of continuous support bands along a passage with the bands disposed substantially parallel to the longitudinal axis of the passage and to each other and at a predetermined distance from each other, means for folding a warp at the entrance of the said passage comprising two folder blades arranged to move the said warp continuously and alternately in opposite directions to form a series of bellows folds between the support bands in the passage, supporting means for each folder blade, suspension means for each supporting means and operating means wherein the suspension means comprises a plurality of suspension members each pivotally connected at one end to a fixed part of the apparatus and pivotally connected at the other end to the supporting means such that the centre-to-centre distance between adjacent pivots of suspension members on the supporting means and the length of at least one suspension member are adjustable.

4. Apparatus as claimed in claim 3 wherein each folder blade is adjustable with respect to the axes of the pivots of suspension members on the supporting means.

5. Apparatus as claimed in any one of claims 3 and 4 in which the supporting means has successive holes each for receiving one of the pivots of the supporting means with the suspension members in order to vary the centre-to-centre distance of these pivots.

6. Method for manufacturing fabrics substantially as hereinbefore described with reference to the accompanying drawings.

7. Apparatus for manufacturing fabrics substantially as hereinbefore described and as illustrated in the accompanying drawings.

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Chartered Patent Agents,
Agents for the Applicant(s).

FIG. 1

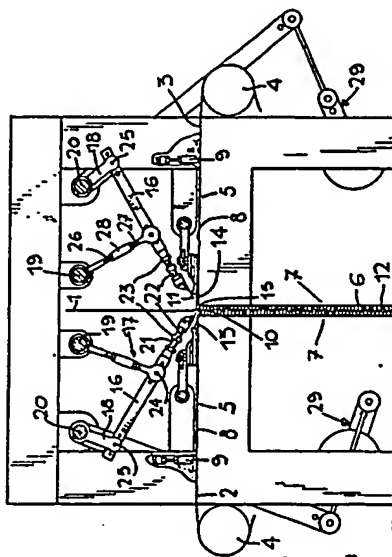


Fig. 2

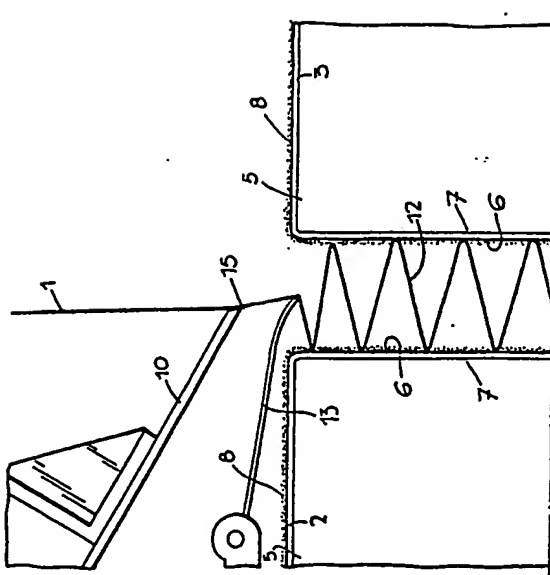
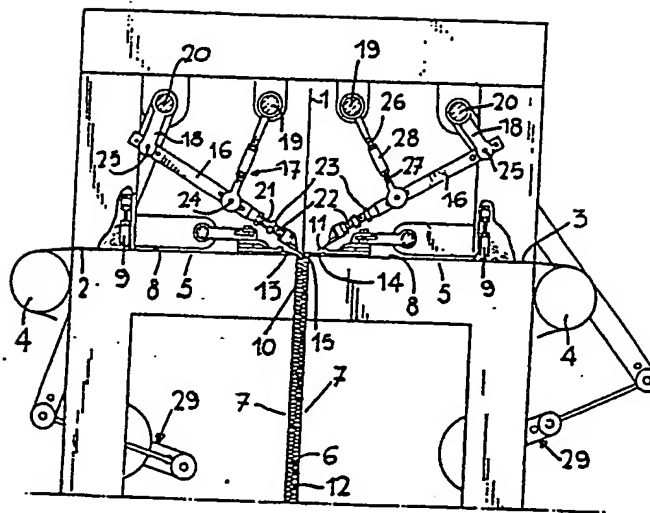


FIG. 1



1121036 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of
the Original on a reduced scale.*
Sheets 1 & 2

FIG. 2

